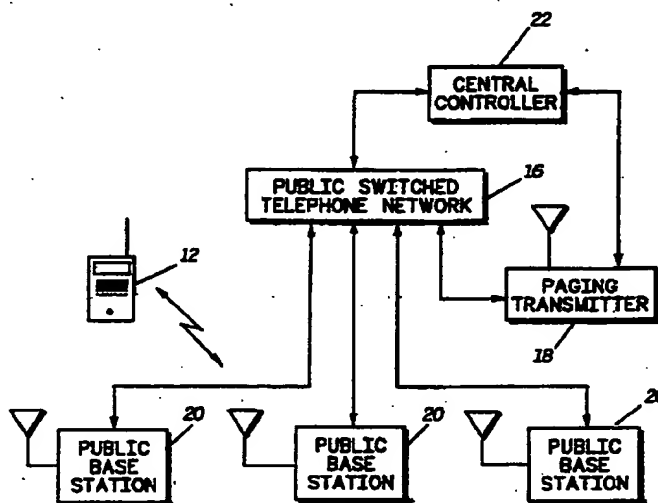


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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: <b>PCT/US92/01150</b> (22) International Filing Date: <b>10 February 1992 (10.02.92)</b> (30) Priority data: <b>659,774</b> <b>25 February 1991 (25.02.91)</b> <b>US</b> (71) Applicant: <b>MOTOROLA, INC. [US/US]; 1303 E. Algonquin Road, Schaumburg, IL 60196 (US).</b> (72) Inventor: <b>BORRAS, Jaime, A. ; 8545 N.W. 177 Street, Hialeah, FL 33015 (US).</b> (74) Agents: <b>NICHOLS, Daniel, K. et al.; Motorola, Inc., Intellectual Property Dept., 8000 West Sunrise Blvd., Ft. Lauderdale, FL 33322 (US).</b>			(81) Designated States: <b>AT (European patent), AU, BE (European patent), BR, CA, CH (European patent), DE (European patent), DK (European patent), ES (European patent), FI, FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, KR, LU (European patent), MC (European patent), NL (European patent), SE (European patent).</b>  <b>Published</b> <i>With international search report.</i>

(54) Title: **CORDLESS TELEPHONE SYSTEM HAVING REMOTE MESSAGE CENTERS**100

## (57) Abstract

A cordless telephone communication system is provided which includes a plurality of subscriber cordless telephones (12) capable of communicating with a PSTN (16) through a plurality of remotely located public base stations (20). Each public base station (20) has a message center which includes accessory devices such as facsimile machines and printers, for providing services which are generally available in an office environment. The subscriber may use the message upon validation of a billing account which incurs charges associated with the usage of the message center.

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**"CORDLESS TELEPHONE SYSTEM HAVING REMOTE MESSAGE CENTERS"****Technical Field**

This invention relates generally to the field of communication systems and in particular to a cordless telephone communication system.

**Background**

Conventional cordless telephone systems include cordless telephones which operate with private base stations at users' homes, offices or other locations which are connected to a public switching telephone network (PSTN). Each private base station is typically meant to be used by one subscriber. The next generation of cordless telephone systems (called CT-2 systems, for cordless telephone-2) include cordless telephones which operate with plurality of public base stations (located at a number of remote telepoints). In CT-2 systems, the cordless telephones may also operate with the private base stations. The communication between the cordless telephone and the PSTN may be established once the subscriber is within range of a public base station, which are generally scattered throughout a coverage area. Accordingly, the subscriber, when in range, may remotely place a call through the public base stations without the inconveniences associated with using present public telephone booths. Placing such a call will not present much difficulty, but

receiving calls through public base stations will present some problems because the subscriber unit may not be located within the access range of the public base stations at any given time. Therefore, the cordless telephones may also operate as a paging receiver for paging the subscriber.

The present invention addresses the desirability of providing the subscriber with office services such as facsimilies, etc., at the remote telepoints which are generally available in an office environment.

### **Summary of the Invention**

Briefly, according to the invention, a communication system is provided which includes cordless telephones which communicate with a telephone network through a plurality of public base stations located at remote points. The public base station include means for providing a wireless communication with the cordless telephones. The public base station includes a message center having message transfer accessory devices for transferring and retrieving information, image, or voice accessory messages.

### **Brief Description of the Drawings**

Figure 1 illustrates block diagram of communication system of the present invention.

Figure 2 illustrates a block diagram of a public base station according to the present invention.

Figure 3 illustrates block diagram of cordless telephone according to the present invention.

Figure 4 illustrates operation flow chart of communication system of Figure 1 according to the present invention.

**Detailed Description of the Preferred Embodiment**

Referring to Figure 1, a communication system 100 for providing services to a plurality of subscribers (not shown), comprises a plurality of public base stations 20 and a plurality of cordless telephones 12, and a public switching telephone network (PSTN) 16. The preferred embodiment of the communication system 100 of the present invention utilizes a well known time division multiplexed CT-2 (cordless telephone second generation) communication system. In the communication system 100, the public base stations 20 are connected to the PSTN 16 to allow cordless telephones 12 to communicate with other wired telephone users. The public base stations 20 are located at remote points, referred to as telepoints, which are scattered through out a coverage area.

Though the CT-2 communication system is well known in the art, its operation will be briefly described in order to help in understanding of the present invention. In the CT-2 communication system, a subscriber may place a call from the cordless telephone 12 when the subscriber is in a sufficiently close proximity of the telepoint (approximately a few hundred yards). The subscribers are assigned a subscriber account (or a personal identification number) which incurs charges due to system usage. The call may be initiated by transmitting a call request which includes the subscriber personal identification number. When the subscriber account is validated a CT-2 link is established between the public base 20 station and the cordless telephone 12 on one of available CT-2 channels. Once the communication is terminated, the subscriber account is billed accordingly.

Referring to Figure 2, the block diagram of the public base station 20 includes a suitable RF transceiver block 212 capable of providing wireless communication between the cordless telephone 12 and the public base station 20. The RF transceiver

212 comprises a well known conventional transceiver for receiving and/or transmitting voice and data information on the CT-2 channels via an antenna 210. The RF transceiver 212 is coupled to a time division duplex circuitry 216 which provides time division multiplexed channel formatting of the communicated information and the CT-2 link. Voice information are processed by an adaptive differential pulse code modulation/ coder decoder (ADPCM/CODEC) block 218 which among other things expands and compresses the voice information to provide the timing for a duplex communication. A PSTN Interface 222 which is coupled to the ADPCM/CODEC block 218 provides for proper transfer of information between the public base station 20 and the PSTN 16. A controller 214 provides the operational control for the entire public base station 20 in a well-known manner including the taking of steps to achieve the CT-2 link.

In one aspect of the present invention, the base station 20 includes a message center 240 which provides the subscribers with a variety of services, such as facsimile machines, printers, video displays, and etc. Therefore, the invention allows a subscriber to perform most if not all office functions from a telepoint provided that the public base station includes a message center. The message center 240 may include a facsimile machine 241, a printer 242, a personal computer 243, a video display 244, and a voice mail 245 which hereinafter will collectively be referred to as message transfer accessory devices. The message transfer accessory devices in the message center 20 are capable of transferring accessory voice, data, and image messages to and from the subscriber. The accessory messages as referred to herein comprise messages that are communicated by utilizing the message center 20's accessory devices, such as FAX machines, etc. The accessory messages are communicated by means of a message center controller 224 which also provides communication ports for coupling to a number of accessory

devices. The message center controller 224 interact with the controller 214 in a known manner for communicating the accessory messages between the message center 240 and the PSTN 16. A subscriber billing block 226 keep track of the occurred charges due to the utilization of the accessory devices as well as providing the signal to the message center controller to enable the subscriber to use the message center 240 once the subscriber account is validated.

Referring to Figure 3, the block diagram of the cordless telephone 12 of the present invention is shown. The cordless telephone 12 includes a well-known RF transceiver 312 for transmitting and receiving RF communication signals via an antenna 310. A TDD circuitry 316 operates in a similar manner as TDD circuitry 216 of FIG. 2 and provides for the formatting of the messages and the CT-2 link. An ADPCM/CODEC 318 receives voice signals generated by a microphone 321 and processes them for transmission. The ADPCM/CODEC 381 also provides voice signals to be rendered audible via an speaker 322. A controller 314 which is programmed in a known manner provides operational control for the cordless telephone 12. The subscriber interacts with the cordless telephone 12 via a keypad 324 for enabling operational features of the communication system 100. The keypad 324 is also used to enable the features of the message center 20. Alternatively, a well known word recognizer 331 may be used to recognize command words uttered by the subscriber for operating the message center. A display block 326 provides visual interaction means for the subscriber. Accordingly, the key pad 324, the voice recognizer 331 and the display block 326 comprise means for operatively interacting with the message transfer accessory devices. A code plug stores the assigned personal identification number based on which a subscriber billing account is charged. A memory 332 provides for temporary storage of data.

In another aspect of the invention, the memory 332 may be utilized to store accessory messages from a public base station which does not have the accessory devices for immediate retrieval of a message directed to the subscriber. The cordless telephone 12 may receive the accessory messages either through the RF transceiver 312 or an external port 329 and store them in the memory 332. In this arrangement, stored accessory messages may be later retrieved from the cordless telephone 12 via the external port 329 by a suitable accessory device in another message center or in the office. For example, if one of the message centers 20 does not include a FAX machine, the FAXed data may be downloaded into the memory 332 upon access by the subscriber which can later be retrieved by plugging the cordless telephone 12's external port 329 to an available FAX machine.

Referring to FIG. 4, the operational block diagram of the communication system according to the present invention is shown. It may be appreciated that steps taken to achieve the purpose of the invention are programmed into the public base station's controllers 214 and 224 and the cordless telephone 12's controller 314 utilizing well known programming techniques. When the cordless telephone is in the idle mode, block 401, the subscriber may choose a service from a displayed menu through the key pad 324 or the word recognizer 331 of FIG. 3, block 403. The CT-2 link is established and the desired subscriber request is processed, block 405. Then a decision is made as to the validity of the subscriber's billing account, block 407. If the validity of the subscriber's billing account is not verified the user is prevented from using the message center services, block 411. However, if the subscriber's billing account is validated the message center is enabled and the subscriber may utilize the desired services. Then the CT-2 channel is freed, block 413, and the subscriber may operate the accessory devices in the message center 20,



block 415. Finally, the subscriber's billing account is charged for the time the subscriber utilized the message center, block 417.

It may be appreciated by one of ordinary skill in the art that the cordless telephone of the present invention may also operate as a pager for receiving paging signals and alerting the subscriber.

In yet another aspect of the present invention, the cordless telephone 12 may receive a paging signal transmitted by a paging transmitter. In this arrangement, a person wishing to leave a message must know the subscriber's vicinity at a particular time. For example by knowing the subscriber will be at the airport at a particular time, the person may direct an accessory message to the message center of an airport telepoint. Upon receiving the page signal the subscriber is alerted to the location and type of an accessory message. The subscriber may then retrieve his or her message from the message center at the airport telepoint either immediately through the accessory devices in the message center 20 or later by retrieving the accessory message in the cordless telephone 12's memory 332.

Accordingly, the communication system 100 allows the subscribers to perform many of the office functions through message centers contemplated by the present invention.

What is claimed is:

**Claims**

1. A communication system, comprising:
  - a plurality of subscriber cordless telephones;
  - a plurality of public base stations located at remote points, including:
    - transceiver means for providing communication between said cordless telephones and a telephone network;
    - and
    - a message center located at each of said remote points including message transfer accessory devices capable of communicating information, image or voice accessory messages with subscribers.
2. The communication system of claim 1, wherein said public base stations further include means for enabling use of said message center when the validity of a subscriber billing account is verified.
3. The communication system of claim 2 further including means for billing said subscriber account number for charges incurred by use of said message center.
4. The communication system of claim 1, wherein said message center includes a facsimile machine.
5. The communication system of claim 1, wherein said message center includes a video display.
6. The communication system of claim 1, wherein said message center includes a voice mail.

7. The communication system of claim 1, wherein said message center includes a personal computer.

8. The communication system of claim 1, wherein said message center includes a printer.

9. The communication system of claim 1, wherein said subscriber unit includes means for operatively interacting with said message transfer accessory devices.

10. The communication system of claim 1, wherein said public base station includes means for transferring said accessory messages to said subscriber unit.

11. The communication system of claim 10, wherein said subscriber unit includes means for storing said accessory messages.

12. The communication system of claim 1, further including means for directing the accessory messages to any particular one of said plurality of public based stations.

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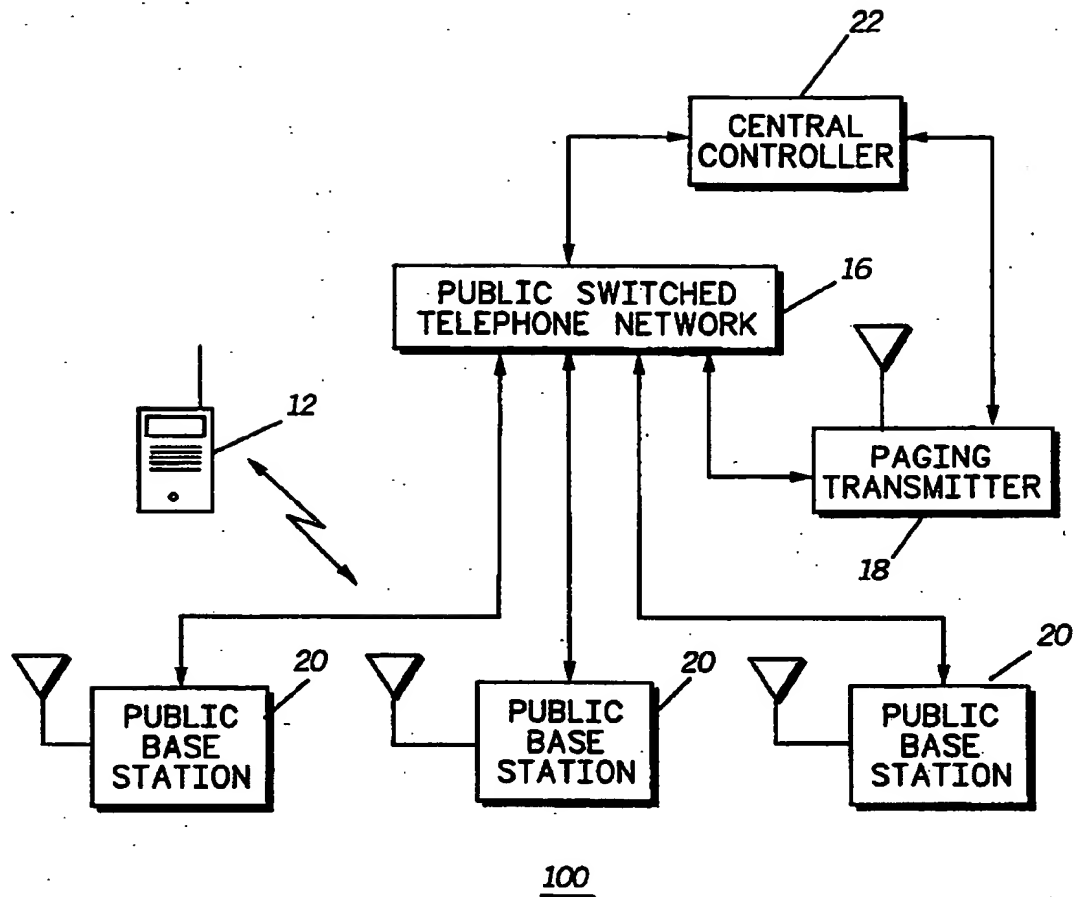
13. In a communication system capable of providing communication between a cordless telephone and a telephone network through at least one public base station at a remote point, wherein said public base station includes means for communicating accessory messages with subscribers via accessory devices included in a message center, said cordless telephone comprising:

transceiver means for communicating messages between said cordless telephone and a said public base station; and

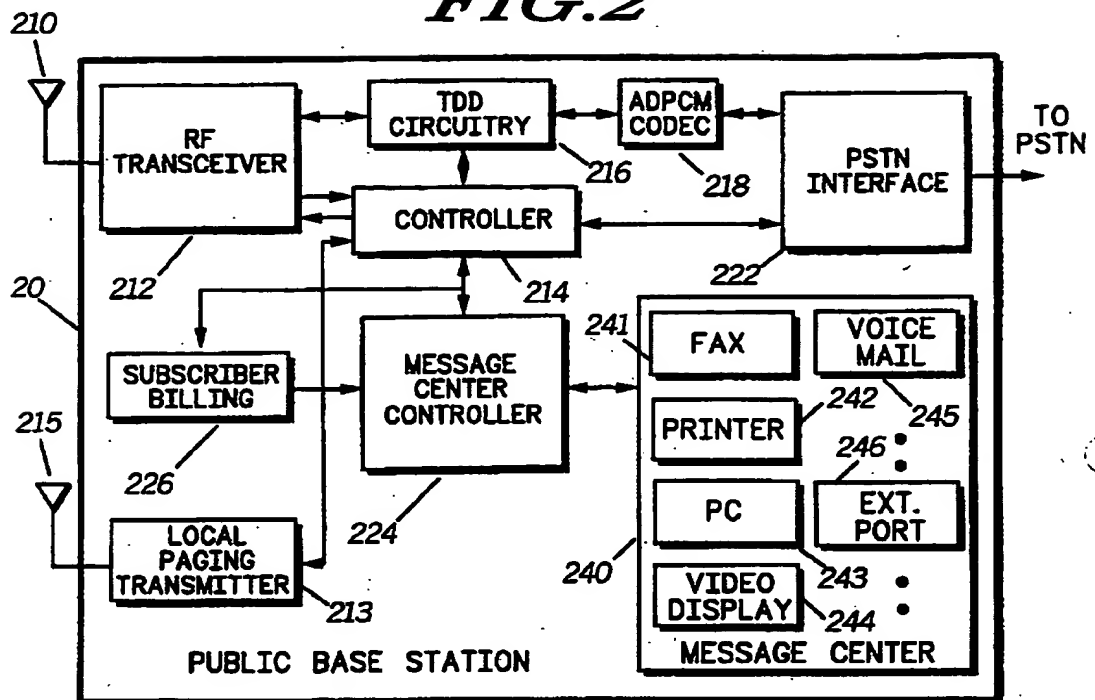
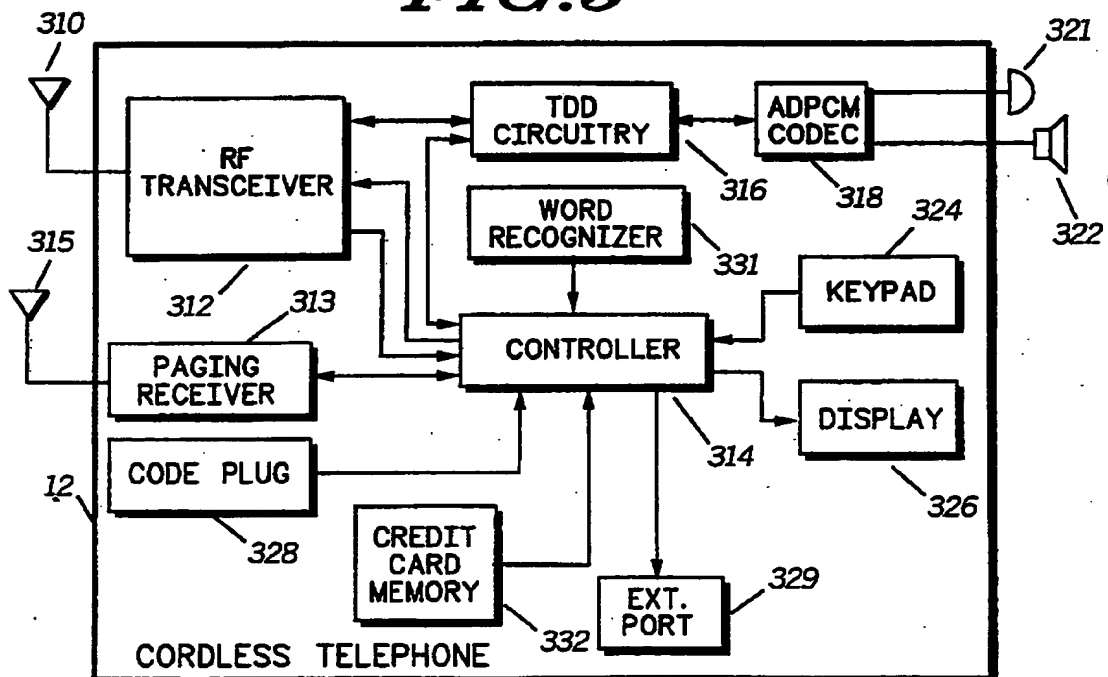
means for operatively interacting with said accessory devices at said message center.

14. The communication system of claim 13, wherein said communication system includes memory means for receiving and storing said accessory messages.

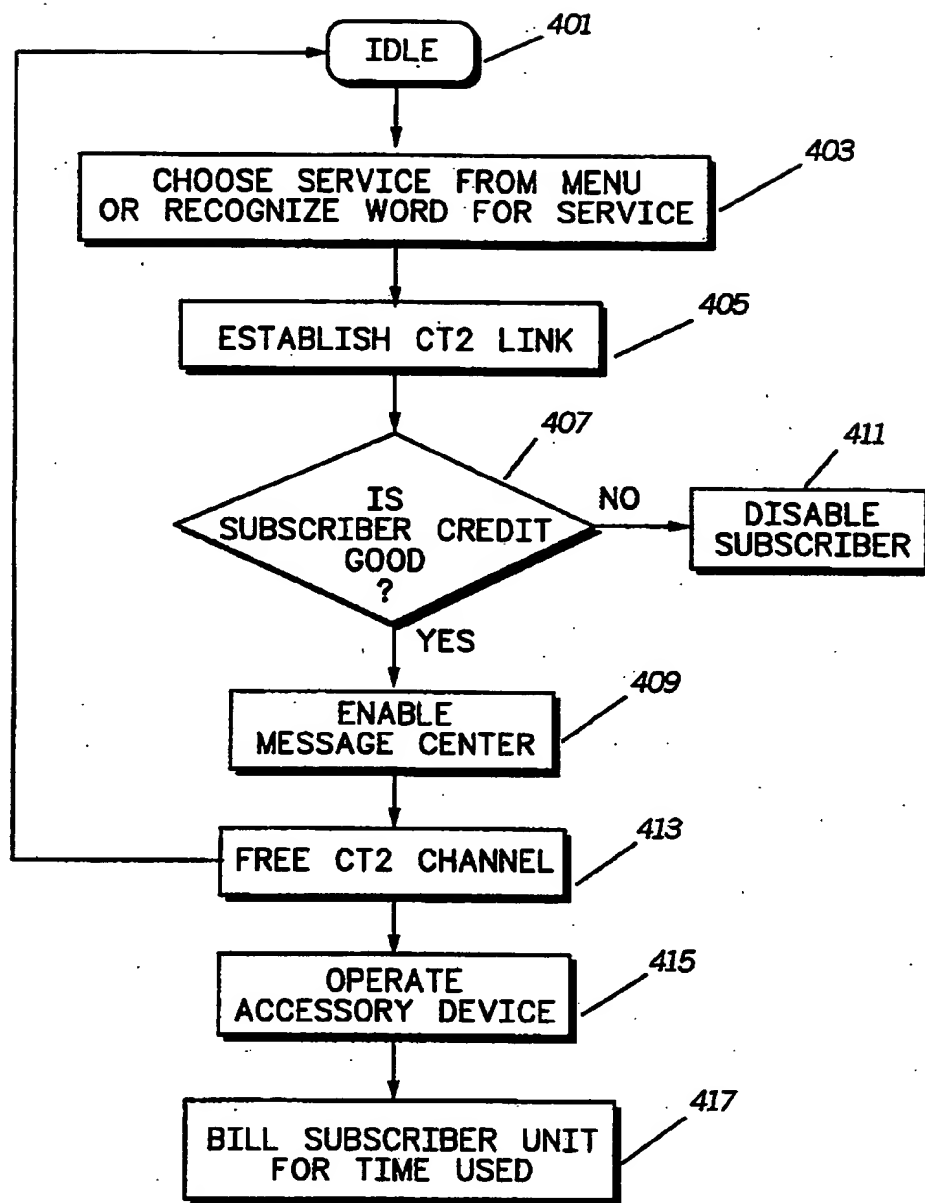
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**FIG.1**

2/3

**FIG. 2****FIG. 3**

3/3

**FIG. 4**

# INTERNATIONAL SEARCH REPORT

International Application No. PCT/US92/01150

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC (5): H04M 11/10		
U.S. Cl.: 379/61		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched *		
Classification System	Classification Symbols	
U.S.	379/61, 62, 67, 58, 100	
Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched *		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT *</b>		
Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages †	Relevant to Claim No. ‡
X	GB, A, 2,216,319 (GEC-MARCONI LIMITED) 04 October 1989 See the entire document.	1-3, 9-11, 13, 14
Y, P	US, A, 5,062,133 (MELROSE) 29 October 1991 See the entire document.	4-8
Y	US, A, 4,941,203 (PATSIOKAS ET AL.) 10 July 1990 See the entire document.	6
Y	US, A, 4,901,340 (PARKER ET AL.) 13 February 1990 See Abstract of Document.	12
<p>* Special categories of cited documents: **</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"A" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
04 May 1992	10 JUN 1992	
International Searching Authority	Signature of Authorized Person	
ISA/US	George J. Oehling <i>North Nguyen</i>	



**FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET**

**V ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE<sup>1</sup>**

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1 ☐ Claim numbers \_\_\_\_\_ because they relate to subject matter <sup>12</sup> not required to be searched by this Authority, namely:

2 ☐ Claim numbers \_\_\_\_\_ because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out <sup>13</sup>, specifically:

3 ☐ Claim numbers \_\_\_\_\_ because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

**VI ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING<sup>2</sup>**

This International Searching Authority found multiple inventions in this international application as follows:

1 ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2 ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3 ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4 ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did <sup>31</sup> invite payment of any additional fee.

**Remark on Protest**

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.